Every Student Counts

Elementary
Professional Development Guide
Year 2 - Day 4

Geometry and Measurement

Iowa Department of Education

Elementary Session – Facilitator's Plan
Year 2 Day 4

Content Goals:

NCTM- Geometry Standard

Apply transformations and use symmetry to analyze mathematical situations

K-2

- Recognize and apply slides, flips and turns
- Recognize and create shapes that have symmetry

3-5

- Predict and describe the result of sliding, flipping, and turning two-dimensional objects
- Describe a motion or series of motions that will show that two shapes are congruent
- Identify and describe line and rotational symmetry in two- and three- dimensional shapes and designs

Use visualization, spatial reasoning, and geometric modeling to solve problems

K-2

- Create mental images of geometric shapes using spatial memory and spatial visualization
- Relate ideas in geometry to ideas in number and measurement

3-5

- Use geometric models to solve problems in other areas of mathematics, such as number and measurement

Principle Focus: Learning

Process Focus: Problem Solving
Communication
Connections
Reasoning and Proof

Overall Teaching Goal:

1. Teaching and learning mathematics through problem solving

Activity	Description for facilitator	Time (min)	Teacher Masters (TM-) & Materials
1. Welcome	Discussion of agenda, goals and sessions for the day Highlight the process standards and principle (learning) Draw attention to the writing in mathematics emphasis as part of the assessment strand.	5	**TM- 1** Daily Plan **TM- 2** Agenda
2. Principle focus: Learning	Summarize learning principle and question 1 from homework. Discussion of understanding Use of writing to enhance understanding	30	**TM 10** Reflection questions for Day 4 **TM 7** What is learning with understanding? **TM 8**Teaching for Understanding
3. Analyzing Student Work	Looking at samples of a task from grade 1	25	**TM 3** Analyzing Student Work
4. Find the word	MDP Review Geometric Terminology	15	**TM-9** Geometric Vocabulary **TM-10 MDP** Find the Word
Break		15	
5. Symmetry Menus	Folding Shapes Dot Grid Line Symmetry Plane Building Symmetry	75	Paper cutouts of shapes Georeflectors or mirrors Colored pencils Dot paper Cubes **TM 11** Folding Shapes **TM-12** Dot Grid Line Symmetry **TM-13** Plane Building Symmetry **TM 14** Reflection Questions for Symmetry Optional: Bridges Unit “Exploring Polygons” Activity 2

Activity	Description for facilitator	Time (min)	Teacher Masters (TM-) & Materials
6. Technology Resources	Transformations and Symmetry	15	Transformations and Symmetry from Classroom Connects
	• LUNCH	45	
7. Introducing angles to children	Participants will explore approaches for teaching angle measurement.	45	**TM- 6** Angle Misconceptions Diagram Poster paper Ruler or straight edge Pair of georeflectors per team of 2
Break		15	
8. Regular Tessellations	Activity from *Bridges to School Mathematics* with focus on the role of conjecture and proof in a geometric context.	35	Bridges Unit "How Can We Prove It?" Activity 3 Overheads 6-10 in unit Handout 5 in unit Pattern Blocks Scissors Georeflectors Pattern Block triangles, squares and hexagons Scissors Protractors Power Polygons or overhead pattern blocks
9. Connecting Geometry	MDP on Projector Math, Fraction Fantasy and Tangrams Puzzle	5	**TM-5** Tangram Puzzle **TM 16** MDP Projector Math 2D and 3D shapes Scissors 6 inch squares cut from construction paper Blank overhead transparencies

Activity	Description for facilitator	Time (min)	Teacher Masters (TM-) & Materials
10. Processing readings and rest of day		25	**TM 15** Teacher Assistance Planning Sheet **TM 3** Reflection on Homework

Facilitator's Tool for Planning the Session
TM 2 Agenda

Equipment and materials the **facilitator** should bring**:** The instructor will need overhead geoboard.

Equipment and materials **participants** should bring: Georeflectors, scissors, rulers, cubes, Navigating through Geometry Grades K-2 and 3-5, pattern blocks,

Handouts

Bridges Unit "How Can We Prove It?" Activity 3
Handout 5
Transformations and Symmetry from Classroom Connects
TM- 1 Daily Plan
TM- 2 Agenda
TM 3 Analyzing Student Work
TM- 4 Reading and Practice Assignments Reflections for Day 3
TM-5 Tangrams Puzzle
TM- 6 Angle Misconceptions
TM-7 What does learning with understanding mean?
TM-8 Teaching for Understanding
TM-9 Geometric Vocabulary
TM-10 MDP Find the Word
TM 11 Folding Shapes
TM-12 Dot Grid Line Symmetry
TM-13 Plane Building Symmetry
TM 14 Reflection Questions for Symmetry
TM 15 Teacher Assistance Planning Sheet
TM 16 MDP Projector Math

Overheads

Bridges Unit "How Can We Prove It?" Overheads 6-10
TM- 1 Daily Plan
TM- 2 Agenda
TM 3 Analyzing Student Work
TM- 4 Reading and Practice Assignments Reflections for Day 3
TM-8 Teaching for Understanding
TM-10 MDP Find the Word
TM 14 Reflection Questions for Symmetry
TM 15 Teacher Assistance Planning Sheet
TM 16 MDP Projector Math

Materials

Paper cutouts of shapes
Georeflectors or mirrors
Colored pencils
Dot paper

Cubes
Pattern Blocks
Scissors
2D and 3D shapes
6 inch squares from construction paper
Blank overhead transparencies and markers
Poster paper
Packet for BERI Writing Strategies in Mathematics

Activity 1: Welcome and Overview
Time: 5 minutes

Overview and Rationale

Particular emphasis for the day will be on the student. Activities will reflect various aspects of the learning principle including the use of writing to enhance understanding and learning. Participants will examine student misconceptions about geometric topics and the use of conjecture and proof to break down those misconceptions.

Conducting the Activity

1) Use an overhead of the Daily Plan to share the content, process, principle and assessment foci for the day.
2) Refer to the yearly outline for more detail.

Materials
TM-1 Daily Plan
TM-2 Agenda

TM-1 Dailv Plan

Every Student Counts means . . .

Teach for Understanding and Focus on Meaning

Problem-Based Instructional Tasks Teaching through Problem Solving	Meaningful Distributed Practice of Concepts, Skills, & Problem Solving

Today's Goals . . .

Content Goals: Geometry

Measurement

Principle Goals: Learning and Assessment

Process Goals: Reasoning and Proof, Problem Solving, Communication, Connections

Today's Objectives . . .

- *Apply transformations and use symmetry to analyze mathematical situations*
- *Use visualization, spatial reasoning, and geometric modeling to solve problems*
- *Apply appropriate techniques, tools, and formulas to determine measurements*

TM 2 Agenda

Time	Activity
9:00 am	Welcome and overview of agenda
9:05	Discussion of the Learning Principle: Writing in Mathematics Classrooms
9:35	Analyzing Student Work in Collaborative Teams
10:00	MDP Geometry Vocabulary
10:15	Break (Parking Lot)
10:30	Symmetry
11:45	Technology for transformations
12:00	LUNCH
12:45	Implementing the Iowa Professional Development Model
1:15	Angle Measure
2:00	Break
2:15	Tessellations
2:45	MDP Projector Math, Fraction Fantasy, Tangrams
3:00	Evaluation and Planning for next year
3:30	dismiss

Activity 2 Discussion of Learning Principle
Time: 25 minutes

Overview and Rationale:
The principle focus for the day is the Learning Principle. This principle focuses on the students' need to understand mathematics in order to use mathematics effectively. In addition to bringing this to our attention, this activity helps participants refine what understanding means.

Conducting the Activity:

1. Ask participants to write their own definition of learning with understanding. Share **TM 7** and its definitions. Note that these align with the findings in the cognitive research that indicated experts have the ability to make many connections to information they are experts in. After a few minutes, have groups look at the various definitions for learning for understanding and work on a table/team/individual definition.
2. Distribute the writing packet and share the following points:
   - Building writing into a task maximizes learning.
   - Classroom experiences that incorporate creating, interpreting and discussion enhance a student's ability to write.
   - In order to write effectively, students need to know the key characteristics of the type of writing they will be doing.
   - Rubrics can be used by teachers and students to assess and improve writing.
   - This is an area where language arts teachers can assist us and why they are also part of the training audience according to the Iowa Professional Development Model.
3. Ask group to share perspectives on the first reflection question: What aspects of the learning principle enhance student engagement?

Materials:
TM 4 Reading and Practice Assignment Reflections
TM 7 What is learning with understanding?
TM 8 Teaching with Understanding
Using Writing to Teach Mathematics packet from Bureau of Education and Research, *Using Writing to Strengthen Your Students' Understanding of Math Concepts and Skills*, Grades 3-6.

TM 7

What does "learning with understanding" mean?

- *For Concepts, students can:*
  - Name it, verbalize it and define it.
  - Identify and create examples and nonexamples.
  - Use models, diagrams, and symbols to represent it.
  - Translate from one representation to another.
  - Recognize various meanings.
  - Identify its properties.
- *For Procedures, students can:*
  - Recognize when appropriate to use a procedure.
  - Give reasons for each step.
  - Accurately and efficiently use the procedure.
  - Use models to verify the results.
  - Recognize correct and incorrect procedures.
  - Generate new procedures or modify familiar ones.
- *For important Processes, students can:*
  - Demonstrate an understanding of problems that are posed orally and in writing.
  - Use a variety of strategies to solve problems.
  - Verify and make sense of solutions to problems.
  - Generalize solutions of already solved problems to new problems.
  - Create or make up problems that challenge class.

"Understanding is the measure of the quality and quantity of connections that a new idea has with existing ideas. The greater the number of connections to a network of ideas, the better the understanding."

John Van de Walle

"Conceptual understanding refers to an integrated and functional grasp of mathematical ideas. Students with conceptual understanding know more than isolated facts and methods. They understand why a mathematical idea is important and the kinds of contexts in which it is useful. They have organized their knowledge into an organized whole, which enables them to learn new ideas by connecting them to ones they already know."

Adding It Up: Helping Children Learn Mathematics

Carpenter, Fennema, Hiebert.

My definition:

TM 8 Teaching for Understanding

- Posing Problem-Based Instructional Tasks
- Engaging student in the tasks and providing support as they develop their own representations and solution strategies
- Promoting discourse among students to share their solution strategies and justify their reasoning
- Summarizing the mathematics and highlighting effective representations and solution strategies
- Extending students thinking by challenging them to use effective representations and/or solutions strategies in new situations.
- Listening to students and basing the instructional decisions on their understanding.

Revised September 2005

TM-4

Elementary Day 4
Reading and Practice Assignments Reflections

1. How can the Learning Principle enhance student engagement?

2. How can teachers' knowledge, beliefs and goals, and their problem solving behaviors influence students?

3. Why is measurement so important to the mathematics curriculum?

4. What were the results of your action research on developing spatial sense?

5. What were your observations regarding "press for learning"?

Activity 3 Analyzing Student Work
Time: 30 minutes

Overview and Rationale:
Participants need to encourage teacher teams to use team time to examine and analyze student work as part of formative assessment in the Iowa Professional Development Model.

Conducting the Activity:

1. Tell participants we are going to model bringing teachers together to analyze student work. In the teacher setting, teachers would bring a sample of low, middle and high student work.
2. Introduce the task. Have participants do the task themselves. Discuss the conceptual understandings needed to perform the task.
3. As a whole group, look at students' work samples. Use **TM 3** to analyze student work.
4. After examining each level of student work, plan next instructional steps needed either for a child or the whole class.

Materials:
Student work samples brought by participants
TM 3 Analyzing Student Work

TM 3 Analyzing Student Work

1. Provide examples of evidence that students have learned the mathematics being taught.

2. Give examples of evidence that students are having difficulty understanding the mathematics being taught.

3. What questions should you ask the child to move them forward?

Activity 4 Find the Word
Time:15 minutes

Overview and Rationale:

This meaningful distributed practice will give students the opportunity to review geometric terminology. By matching the definition to the vocabulary word, participants discuss which words can or cannot fit that particular description. This allows for a more in-depth understanding of the vocabulary.

Conducting the Activity:

1. Cut apart the definition cards and the descriptions.
2. Show a description on the overhead. Discuss which vocabulary word would match this description. Prove why it doesn't match the other words. Ask participants to draw a picture to match the description and word.
3. Continue to follow the MDP's format for the remaining days. Discuss how some words are more difficult to define.

Materials:

TM 9 Geometric Terminology
TM 10 Meaningful Distributed Practice: Find the Word

TM-9 Geometric Terminology

Equilateral Triangle	All sides of the triangle are of equal length (congruent).
Flip	A motion that is a mirror image of the original shape.
Slide	A shape is oriented the same way as the original, but just slid into a different position.
Turn	One point is held down and all other points are turned around it.
Line Symmetry	Figures have at least one line of symmetry dividing figures into identical parts which are mirror images of each other.
Congruence	Figures have the exact same shape, proportion, and size.
Similarity	Figure have the exact same shape and proportion, but may be of different size.
Polygon	Straight –sided closed plane figure.
Polyhedron	Three-dimensional shape whose faces are formed by polygons.
Regular Polygon	All sides and angles of the polygon are congruent.

TM 10 MDP Find the Word

Distributed Practice and Questions: Find the Word (Review) Grade Level: K- 2

Big Idea(s) Students will identify a word through the definition or description given.

MDP Activity 1	MDP Activity 2	MDP Activity 3	MDP Activity 4	MDP Activity 5
Show definition and read to the class. *"A straight sided closed plane"*	Show definition and read to the class. *"All sides and angles of the polygon are equal"*	Show definition and read to the class. *"Figures have the exact same shape and proportion, and size"*	Show definition and read to the class. *"A motion that is a mirror image of the original shape."*	Show definition and read to the class. *"Figures have at least one line of symmetry dividing figures into identical parts which are mirror images of each other."*
Questions: **Which words do you know doesn't fit the definition?** **Is there part of the word that can give you a clue that it matches the definition?** **Which word matches this description?**	**Questions:** **Which words do you know doesn't fit the definition?** **Is there part of the word that can give you a clue that it matches the definition?** **Which word matches this description?**	**Questions:** **Which words do you know doesn't fit the definition?** **Is there part of the word that can give you a clue that it matches the definition?** **Which word matches this description?**	**Questions:** **Which words do you know doesn't fit the definition?** **Is there part of the word that can give you a clue that it matches the definition?** **Which word matches this description?**	**Questions:** **Which words do you know doesn't fit the definition?** **Is there part of the word that can give you a clue that it matches the definition?** **Which word matches this description?**
Assessment: Have children draw a picture to match the definition.	Assessment: Have children draw a picture to match the definition.	Assessment: Have children draw a picture to match the definition.	Assessment: Have children draw a picture to match the definition.	Assessment: Have children draw a picture to match the definition.

Activity 5 Symmetry
Time: 75 minutes

Overview and Rationale:
This activity will challenge participants to think deeply about the mathematics when planning lessons. When working with teachers, trainers need to encourage teachers to look beyond the isolated skill practice that might be found in texts and to understand mathematics more deeply. Through collaborative reflection on these tasks, participants will experience a model that can be used to probe into tasks before they are delivered.

Conducting the Activity:
1. Mix up the audience randomly.
2. Design stations for each activity. Make enough activity copies for each group to b e no more than 10 and in an even number if you can.
3. Each station has an enlarged copy of the instructions and each participant needs a copy of the directions.
4. Give general directions on each station. Allow 20 minutes per activity. In the last 5 minutes at each station participants should stop and reflect using the Reflection Questions for the task.
5. Materials should be prepared to hand out to tables or set at stations ahead of time.
6. After 60 minutes, bring group together for discussion about the format and insights gained during the activity.
7. The Bridges Unit "Exploring Polygons" Activity 2 has other activities that can be added to make stations.

Materials:
TM 11 Folding Shapes
TM 12 Dot Grid Line Symmetry
TM 13 Plane Symmetry Buildings
TM 14 Reflection Questions for Symmetry
Optional Bridges Unit "Exploring Polygons" Activity 2
Dot paper
Cubes
6 inch square paper
Colored pencils
Georeflectors
Paper shapes as described in **TM 11**

TM 11 Folding Shapes

Materials

- Paper cutouts of shapes (triangles, squares, circles, pentagon, etc.)
- Colored pencils
- Mira or Georeflectors or mirrors

Directions:

1. Choose a shape with edges. Find all the lines of symmetry using the Mira. Use the colored pencils to make each line of symmetry a different color.
2. Do the same with the rest of the regular polygons.
3. Order the shapes by the number of lines of symmetry from least to greatest.
4. Write a generalization about the relationship of the lines of symmetry to the number of sides of a shape.

Extension:

1. Do the same activity adding circles, ovals, and irregular polygons.
2. Does your generalization hold for all figures? Can you write a new generalization if it does not hold?

TM 12 Dot Grid Line Symmetry

Materials

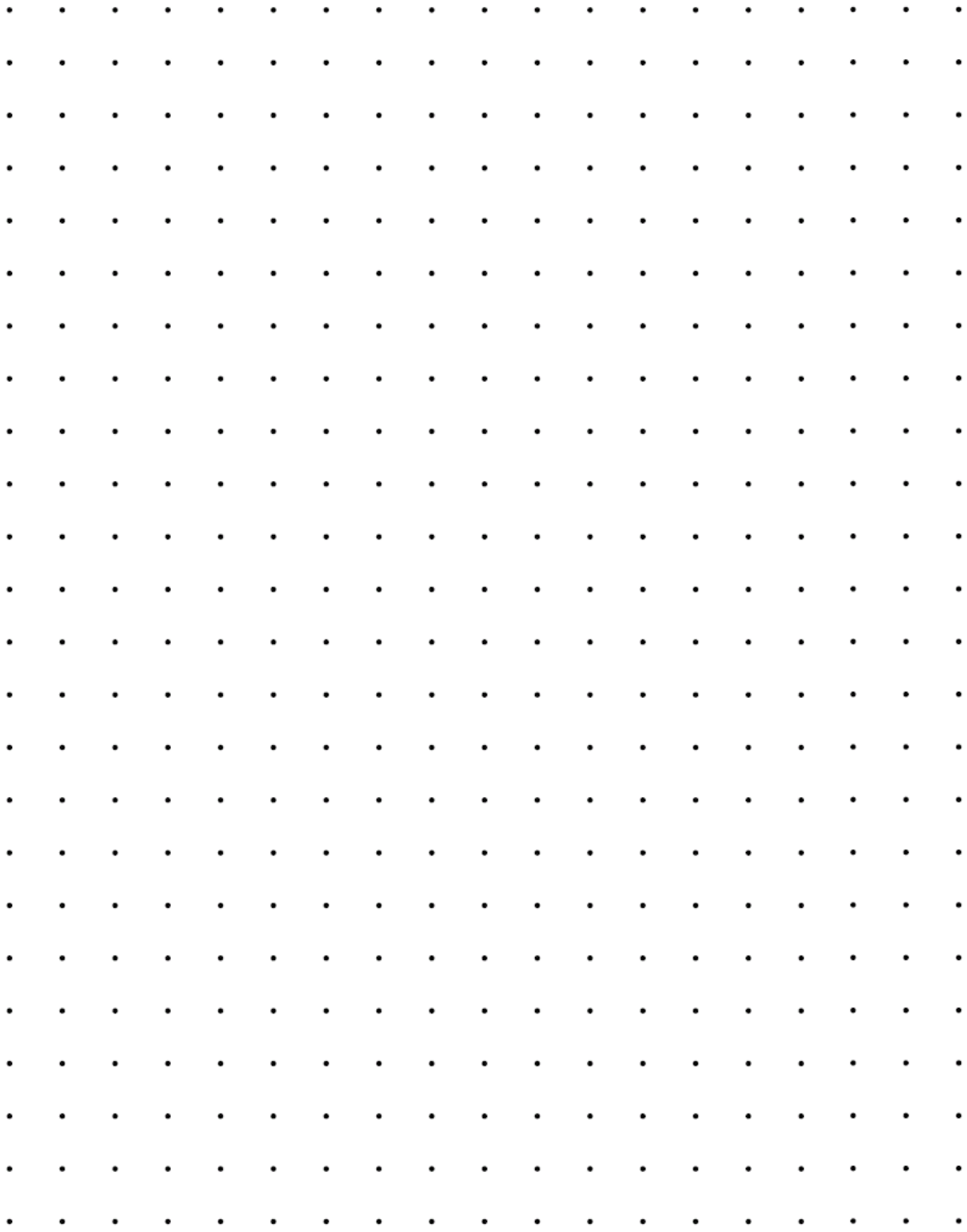
- Isometric or regular dot paper
- Pencils
- Mira

Directions:

1. Draw a line through several dots. It can be horizontal, vertical or skewed. Make the design completely on one side of the drawn line and touches the line in some way.
2. Exchange your design with someone else. Then make the mirror image of their design on the other side of the line.
3. Use the Mira to verify your design is symmetrical.

Extension:

1. Create another design with more than one line of symmetry.



BLM 10—1-cm square dot grid

TM 13 Plane Symmetry Buildings

Materials

- Cubes
- Mira

Directions:

1. Using a cube shape, find all nine different planes of symmetry. Record your findings with a diagram and/or description.

Extension:

1. With cubes, build your own building that has at least two lines of symmetry.

TM 14 Reflection Questions for Symmetry

TASK TITLE _____

1. How does this task enable struggling learners to be successful?

2. How does this type of activity support learning of ESC goals?

3. What important concepts are explored in this task?

4. Where is this type of thinking applied in society?

Activity 6 Technology Resources
Time: 15 min.

Overview and Rationale:
Technology can enhance the study of transformations because of the experimentation that can go on. Be sure and give students opportunities to create first without technology in order to build the necessary foundation of the mathematics.

Conducting the Activity:

1. Using the resource from Classroom Connect demonstrate or allow participants to explore several of the websites.
2. Ask these questions about the activity resource:
    a. How does this resource add value to the lesson? Could you do this lesson as effectively using conventional means?
    b. Does this resource lead to students' higher order thinking and reasoning?
    c. Will the students be fully engaged with the lesson?
    d. Was the technology invisible and the math predominant or did the technology distract the student?

Materials:
Transformations and Symmetry list from Classroom Connect Summer 2004

Activity 7 Measuring Angles
Time: 45 minutes

Overview and Rationale
Elementary children need to think of angles as amount of turn. Many misconceptions about what is being measured affect their understanding of this. This activity helps children see angles as a rotational measurement and in turns, wedges or ramps, in a figure and as joining two rays.

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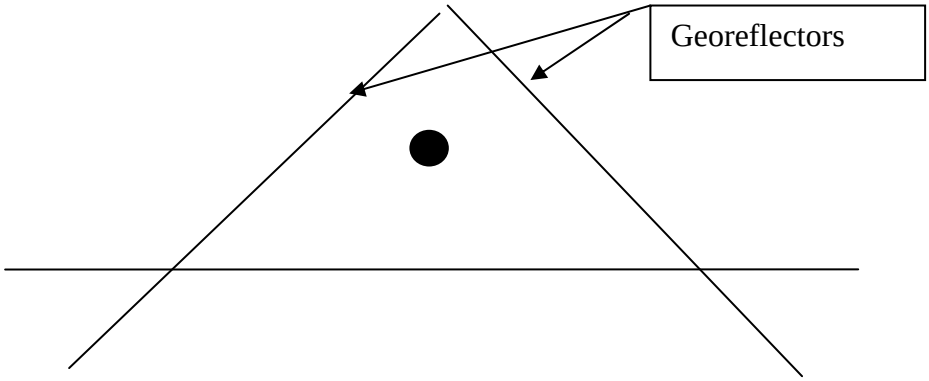
Conducting the Activity:
Part 1

1. Have participants think about the measurement of angles individually. What are some misconceptions or misunderstandings that occur? After a few minutes, share **TM 6**.
2. Share overhead **TM 6**. Learners are often misled by orientation. They do not understand the attribute being measured. Before we talk about units such as degrees, we need to help students focus on what is being measured. Logo language has been proven to enhance understanding of measure of turn. Activities in the classroom where students give commands such as "right turn 45 degrees" or "half of a quarter turn to the left" to each other in a maze can help.
3. Share some information from 1996 NAEP. Only 33% fourth graders NAEP items could identify angles smaller than a right angle correctly. Fewer than 15% could sketch an angle larger than a given measure.
4. Using a piece of plain paper, identify the right angle in a corner of the paper. Ask why is this called a right angle? Connect to the geometry ideas of squares and rectangles that have 4 right angles and how students when viewing a ray still do not automatically get the connection.
5. Put participants in groups of 2-3. Using an 8 x 11 paper for a benchmark of 90 degrees, make as many different angle measurements you can. You may fold or turn the paper to find ways to make angles. Record them on a poster sheet. Label your angle using letters and give its measurement using correct notation or words: angle A= 12.5 degrees.
6. After 15 minutes, bring the group together. How many angle measures was the group able to make? List the measures on the overhead. If any are disputed as possible, have the team describe how the angle was made. How did this activity enhance our understanding that an angle is a measure of turn and that the right angle can be used as a benchmark? Did anyone make a 360 degree angle? Do you think students would?

Part 2

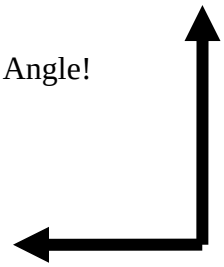
1. Another way to view the angle of turn is to use georeflectors. Draw a line across a piece of paper about 3 inches long. Make a dot about 2 cm above that line. Placing georeflectors on the paper as shown determine the name of polygon, number of sides and the size of the central angles. Is there a relationship?



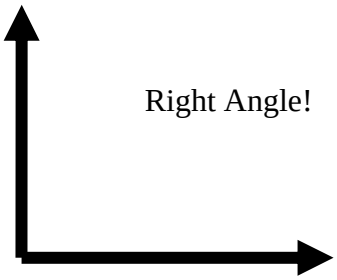
Materials:
TM 6 Angle Misconceptions
Poster paper
Ruler or straight edge
Pair of georeflectors per team of 2

TM 6 Angle Misconceptions

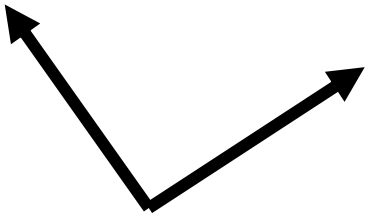
Left Angle!

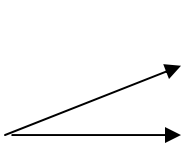


Right Angle!



??? Angle!





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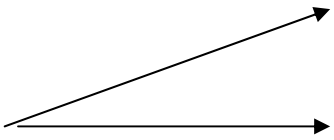

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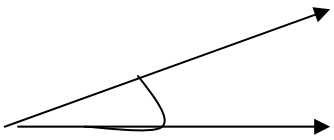

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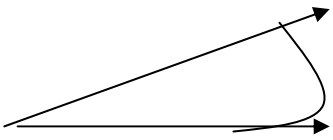

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Activity 8 Regular Tessellations
Time: 30 minutes

Overview and Rationale:
Participants will explore tessellations with regular polygons and use reasoning and proof.

Conducting the Activity:

1. Describe the term tessellations. This is a mosaic-like tiling of a plane with polygons. You might refer to them in activity 6 to prepare for this activity.
2. Participants should cut out shapes from handout 5. Use these shapes and pattern blocks to create a tessellation.
3. Launch: Ask participants to share their designs at their tables and look for similarities or other observations they notice among them. Gather observations in a group discussion.
4. Exploration: Do these ideas hold true for all polygons? Find all polygons that can make a regular tessellation. A regular tessellation is one that uses regular polygons only. Show overhead 6 and 7 to demonstrate irregular tessellations.
5. Follow the remainder of the activity using the Bridges guide.

Materials:
Bridges Unit "How Can We Prove It?" Activity 3 Handout 5 and Overheads 6-8
Pattern Block triangles, squares and hexagons
Scissors
Protractors at each table optional
Power Polygons or overhead pattern blocks

Activity 9 Connecting Geometry
Time: 15 min

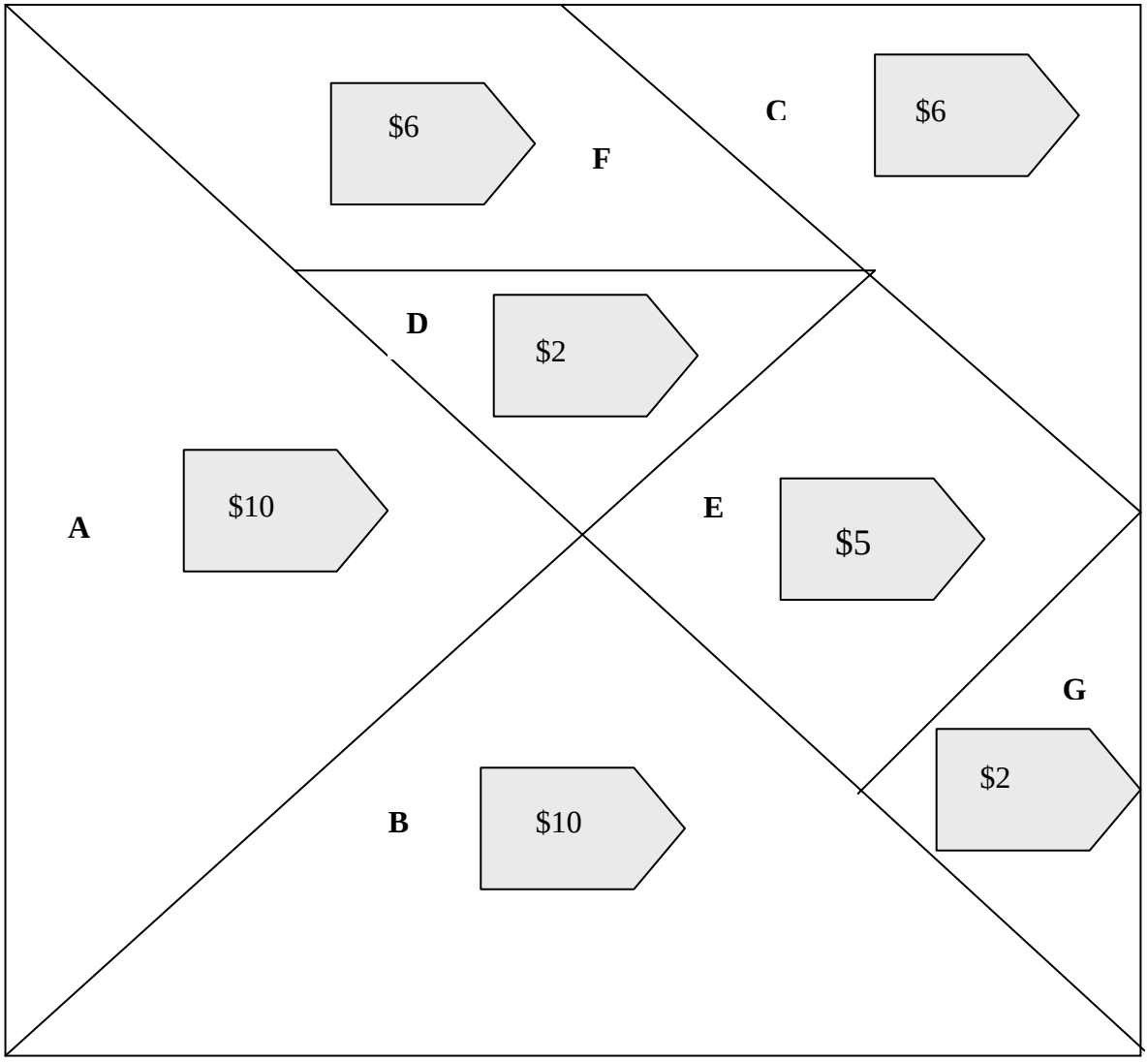
Overview and Rationale:
Participants will investigate, describe and reason about the results of subdividing, combining and transforming shapes. Activities like these connect geometric ideas to other math content such as number concepts. This activity is described in more detail in *Navigating through Geometry 3-5* on pages 88-89.

Conducting the Activity:

1. Give each person a set of six inch square construction pieces. Instruct them to create models of one half that are not congruent to any other previous model. How many ways can they create one half? Share some of the solutions found.
2. Ask participants to create models for thirds, fourths, sixths, eighths, tenths, twelfths. Keep a journal record of fraction models and whether it was difficult or not to create it.
3. When sharing solutions, ask participants to prove that the parts are congruent using transformations (flips, slides and reflections)
4. Refer to problem solving task with tangrams on **TM 5.** Pentominoes puzzles can also contain connections.
5. Writing reflection: How did writing enhance this activity?

Materials:
TM-5 Tangrams Puzzle
TM 16 MDP Projector Math
2D and 3D shapes
Scissors
6 inch squares cut from construction paper
Blank overhead transparencies

TM 5 Tangram Puzzle



Tangrams Tasks

1. Use D and another piece to make a $4 triangle. Can you make a $4 square with them?
2. Use three pieces to make a $10 rectangle. What other shapes can you make for $10?
3. Make a square. How much did it cost? Make other squares and note their cost.
4. Make a $20 polygon. How many sides? How many angles? How many different $20 polygons can you make?

TM 16 MDP Projector Math

Distributed Practice and Questions:

Grade Level: K- 2

Big Idea(s) Students will identify two and three-dimensional shapes from their images.

MDP Activity 1	MDP Activity 2	MDP Activity 3	MDP Activity 4	MDP Activity 5
Place five or six different items (book, pencil, paper clip, etc) on a table .Cover with a cloth. Tell the students you are going to shoe them the items and they are to remember what they see and how they are arranged.	Place three to five flat shapes on an overhead projector. Turn off the projector and remove one shape. Turn the projector back. Repeat, changing shapes and increasing the number of shapes to increase the level of difficulty	Place five to seven flat shapes on an overhead projector. Turn off the projector and remove one shape. Turn the projector back. Repeat, changing shapes and increasing the number of shapes to increase the level of difficulty.	Place three to five three-dimensional blocks on an overhead projector. Use a barrier so students can't see the actual objects. Turn off the projector and remove one block. Turn the projector back on. Repeat, changing blocks and increasing the number of blocks.	Place three to five three-dimensional blocks on an overhead projector .Use a barrier so students can't see actual objects. Turn off the projector and remove one block. Turn the projector back on. Repeat changing blocks and increasing the number of blocks.
Questions: **How many items did you see?** **What were the items?** **Did you notice what item was next to each other?**	**Questions:** **Which shape is missing? Is the triangle above or below the square?** **Which shape is between the square and rectangle?** **Which shape is the farthest from the triangle?**	**Questions:** **Which shape is missing?** **Which shape is closest to the hexagon?** **Which shape is between the triangle and square?**	**Questions:** **Which block was removed?** **Which three-dimensional object could cast this image?**	**Questions:** **Which block was removed?** **Which three-dimensional object could cast this image?**
Assessment	Assessment Ask student to draw the shapes they saw in the correct placement.	Assessment Ask student to draw the shapes they saw in the correct placement.	Assessment Ask student to draw the shapes they saw in the correct placement.	Assessment Ask student to draw the shapes they saw in the correct placement.

Activity 11 Team Processing
Time: 25 minutes

Overview and Rationale:
As trainers we need to be monitoring the effectiveness of the training through assessment of the teaching and learning in the classroom. After gathering this information, we need to design tasks, activities and tools that will assist them in developing weak areas. During this activity we will give teams time to anticipate teacher behaviors that they may need to address in training next year.

Conducting the Activity:

1. Have teams process the questions from TM 3 from homework questions 2 and 5 by sharing observations of teachers. Then ask teams to create actions they will take to ensure teachers will develop skills in these areas.

Materials:
TM 15 Teacher Assistance Planning Sheet
TM 3 Reflection on Homework

TM 15 Teacher Assistance Planning Sheet

Teacher Behaviors Observed/Noted	Planned Support for teachers by our team